

Imitation

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May, 1912

Submitted to the Department of Philosophy of
the University of Kansas in partial fulfillment of
the requirements for the Degree of Master of Arts

I M I T A T I O N.

In partial fulfillment of the requirements
for the A. M. Degree.
Submitted to the Department of Philosophy
and Psychology of the University of
Kansas.

May, Nineteen hundred twelve.

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Imitation.

I. In Animals.

Every concept requires careful definition when it is taken over into the realm of scientific usage from the parlance of common conversation. Terms that have long been supposed to have a definite, well-known meaning are frequently not looked into by the very reason of their familiarity. When we inquire into the use of the term 'imitation' we are appalled by the vagueness of its application not only among the unscientific but among psychologists as well. The fact of imitation itself has apparently been so universally familiar that it has long been taken for granted.

But now that all the old highways as well as the recesses in the science of psychology are being subjected to careful study and investigation, the word imitation is found to be variously used by writers in psychology. The fact of imitation itself has become a subject of controversy and that frequently for no other reason than a misunderstanding concerning the use of words. This controversy has however not been wholly a quarrel for the use of a word, since one soon finds that the phenomena designated by this term are not very readily distinguishable among themselves. They shade into each other almost imperceptibly.

In the face of such a situation it will be worth our while in a review of this subject to inquire carefully into the usage of the term 'imitation'. This done, it is the plan of the first part of this paper to present and discuss more in detail certain evidences of imitation among animals, as they are collected by observational and experimental

methods; and finally to offer briefly a discussion of the methods and the results of the study of animal intelligence. The second part takes up imitation in the child in a similar manner.

Mr. Steel is a typical representative of 122 those who would extend the use of the term 'imitation' to reactions in the inorganic world. Illustrations may then be readily found. Crystallization, pseudomorphism, etc. he regards as imitative. Just so wave-transmission is regarded by him as imitative, in which case it is explained that since the molecules act in a similar fashion, they imitate each other. On such grounds it might be said that two billiard balls imitate when they successively go thru similar movements. Similar action is produced by similar conditions in a purely mechanical way and the most that could be said of such reaction is that it is mimetic in nature.

M. Tarde discusses imitation as the cause 128 and motive power of the institution and progress of society. "Le societe, c'est imitation". With him it is an abbreviating process, i.e. the many mistakes that were inevitable in the working out of the act are dropped.

The examples of these two writers include all possible reactions, those requiring no consciousness whatsoever as well as those that are accompanied by consciousness.

It is evident from the common use of the word that reactions of some sort are meant when we speak of imitation. In the second place it is understood that the actions thus called imitative must resemble those outside the organism which were imitated

and be not purely mechanical reactions, but they must to some extent be produced (spontaneously) from within. Let us inquire further into the meaning which writers and investigators give to this term.

Lloyd Morgan tells us that "instinctive procedure is characterized by a special relation of the external stimulus to the response. When this stimulus is afforded by another animal and the responsive behavior it imitates is similar to that which affords the stimulus, such behavior may be termed imitative."

Some acts are imitative in their effects but not in their intention; i.e. they are so from the point of view of the observer only, while the subject had no conscious purpose to act similarly to the model of the stimulus. This is the involuntary or instinctive type, or as Morgan suggests, we may call it "biological" as distinguished from "psychological" imitation. Thus the chick pecks because it sees the mother peck. This is imitative in effect but not in purpose. It is an objective imitation merely. When it develops, it may readily lead to a deliberate imitation in which the objective imitation is produced by a conscious purpose and we then have voluntary imitation which is both objective and subjective. Mr Morgan names 1. instinctive imitation as the lowest stage. This is the type in which, for example, a sound heard becomes a stimulus to the motor mechanism of sound production. 2. The intelligent stage of profiting by chance experience, and 3. Intentional or reflective imitation are named. In the human child all these stages may be successively or simultaneously observed.

Winnaman classifies the imitative activities 68

in another way:

1. Mimicry, which is below the level of imitation proper.

2. Instinctive imitation or automatic behavior.

3. Intelligent imitation.

a) Of actions which are simple, consisting of single efforts, but with no succeeding attempts with a view to improvements.

b) Of results, i.e. persistent imitation, consisting of several attempts at improvement.

Mr Berry thinks "the word voluntary expresses 19

more clearly than does the word intelligent what meaning we desire to convey when we wish to speak of a purposive act of imitation". There does seem to be a need for a distinction among the imitations above the instinctive level and we shall come back to this question again before leaving it.

Professor J. M. Baldwin gives four types 12
of imitation: 1. Instinctive imitation, of which the mocking bird imitating the sparrow affords a good instance. 2. A reflex action as, for example, a beaver imitating an architect. 3. Suggestion, as when a child repeats the motions or sounds of its nurse or playmate. 4. Imitation by volition, as when a man does as his rector does. The common element of all such cases is "a constructive idea which we see objectively" and which each being repeats in its results. Even suggestion seems to have this idea which may be a visual, an auditory, a tactual, etc. copy in the mind and which reacts outwardly by a repeated copy.

The question that Professor Baldwin would answer is how any real imitation occurs. How is this reproduction brought about? He is of the opinion that random movements are the material with which we must begin. Some of these are useful and if any of them "result in immediate duplication of their own stim-

ulus", there is occasion for another reaction of a similar kind. Such reactions would have a great advantage over others that do not reproduce their own stimulus and would naturally persist while others would drop out. According to Baldwin such imitation assumes consciousness, "for it is difficult to see how a reaction which reproduces its own stimulus in an exact material way could ever begin or ever stop when begun" like a selfrepeating whirlwind. Such imitation seems to be approached in the case of some children and in parrots that repeat the same sound endlessly until exhaustion is reached. Here the sound produced furnishes the stimulus for a repetition of the same sound which in its turn stimulates the organism for the next identical reaction, etc. Unless there be conscious^{ness} accompanying imitation endless repetition would be the typical reaction of the organism if it ever got started. But it is hard to see how it might ever begin. Consciousness for Baldwin is as original as anything else. All reactive tissue is always conscious.

A memory, too, serves as a copy for imitation which is taken over from the world into consciousness. This trick of retaining a copy of an actual object in memory is a device of the organism to nullify distance in space and time. In every act we would then have a case of imitation of what is before me or of what exists in an abbreviated form, either as a memory or as an imagination, the elements of which originated in experience. When I see a man and write his name, the percept of the man calls up the visual or auditory image of his name and this I imitate. The processes of association call up connec-

ted images and all they can do to bring about action is to furnish the picture to be imitated. Actions which were simply imitated suggestions in their origin may lose all appearance of their true origin.- Thus a musician may play a piece of music upon hearing its name or by reading printed notes. The beginning of such action was an imitation of the movements and the sounds which his instructor made. The intermediate copies have fallen away so that imitation is no longer recognized as such. Baldwin would apply the word 14 e.a. imitation to explain in a similar manner the origin of both impulse and instinct as modified and compounded imitations. A bird's nestbuilding instinct, he asserts, was at first a case of copying and just so the impulses of man are copied, but here there are omitted more intermediary stages.

Since Professor Baldwin considers the motor aspect of such processes as recognition, attention and formation of concepts to be their essential feature, it will be seen that in making imitation the basis of all intelligent action he is putting it at the foundation of all mental life. This was unquestionably an entirely novel way of applying that term and his explanation of the mechanism of imitation is very attractive in that it explains so much. Yet this all-inclusiveness stands in the way of clearness and definiteness. For the purposes of this paper I shall therefore in part I. abstract from Professor Baldwin's rather intricate meaning of imitation, however much it may appeal to the speculative desire for unity and fundamental explanations.

Another point which deserves brief consideration is the question as to whether or not imitation is an instinct. Both attitudes have been taken by the writers of note. Thus Professors James, Royce and Tarde, for example, regard imitation as hereditary

and instinctive. It has been maintained by others that as there are only memories and no memory in ~~g~~ general so there is no such thing as imitation but only imitative acts.

Mr. French holds and expounds the theory 49 that imitations are ideo-motor and that the act depending on a perception of others' acts is as much an acquired act as the perception is acquired. A large fund of motor associations constitutes the mechanism of the ideo-motor activity; i.e., just as imagination uses the material of past experience only, so imitation must secure all its motor elements from previous motor experience. French meets the objection that imitations must be instinctive since the activities of the same species are more extensively copied than are those of inorganic objects very cleverly. He explains that "these activities are more interesting, more important, more closely attended to, hence more clearly apprehended and therefore assume control of the ideo-motor mechanism". French calls this ^{the} "simple experiential theory of the workings of imitation".

The fact that still remains unexplained is that imitative acts are so evidently selective. It seems that on this theory all vivid motions, sounds and so forth would have an equal chance to be imitated.

Many evidences would at first sight seem to indicate that particular imitated acts are not necessarily done by instinct. Many birds are known to learn the songs of other birds very perfectly and this particular reaction can impossibly be inherited of instinctive. Wallace draws the con-

clusion that the peculiar songs or melodies acquired by birds are so acquired by imitation just as a child does not learn English or German instinctively but by hearing the language of the parents spoken. Groos points out that it is nevertheless a fact that the impulse to utter tones is instinctive and that the very tendency to imitate has an instinctive origin.

All ideas have in them the seeds of their outward expression but the apperception of a picture of motion does not of itself determine its expression. Animals do not try to imitate all the motions seen but only those for which they were predisposed by inheritance. A child does not imitate the motions of the pendulum nor does the young lion leap into the water upon seeing another animal jump in. The assertion that imitation is not an instinct is sometimes based upon the fact that it does not appear in the child previous to the fourth month of its life. This is no valid argument against the idea that the impulses are inherited as no one would attempt to prove when acquainted with the fact of the "transitoriness of instincts".

Many ideas or acts call out the reactions that are no doubt objective, reflexive imitation. The perception or the idea of yawning affords an illustration in point. This is undoubtedly based on many previous associations of the idea with the act and is therefore ^{based} not so much on a pure instinct as upon an acquired reaction. Groos objects that we feel an almost irresistible tendency to imitate a new manner of greeting, for example, and this must be based on an instinctive tendency to imitate, since there are no old associations, the whole action being a novel one in the experience of the individual. Groos believes that the imitative impulse is an inherited instinct which favors the development of intelligence by ren-

dering many other instincts superfluous, as it were, thus placing the individual animal in a more ^{any} dependent position as regards its relation to the species.

The most satisfactory preliminary classification of the different types of imitation for our purposes will be one based on that of Lloyd Morgan 81 and which is practically the same as the classification worked out by Mr. Porter. - 89

1. Mimicry is a reaction or more generally a structure that may look objectively like an imitation, but it is determined wholly by forces outside the individual so that it falls below the level of imitation. In mimicry the action or structure is predetermined for the individual.

2. Instinctive imitation is also inherited but the emphasis is on the function rather than on the structure. That which is imitated is not copied in so fixed a manner as mimicry demands. A good deal of the individual will appear in such imitation but the act will be done readily and automatically, being predetermined by the experience of the species. The relation of mimicry ~~of~~ mimicry to instinctive imitation is the same as that of reflex action to instinct. The following-instant is an example of the former while the well-known cases of imitation of songs illustrate the second type we have mentioned.

3. Intelligent imitation is not to be understood as synonymous with "reflective", "intentional" or "voluntary" imitation. This distinction is not generally made, but "profiting by experience" has come to be the generally accepted meaning of animal intelligence among animal psychologists. Hence

"intelligent imitation" should be kept apart from the words which indicate the presence of reasoning.

4. Reflective, intentional or voluntary imitation involves mental analysis of a high order.

The evidences that are offered to show the existence of imitation in animals have been collected by two generally distinguishable methods. The first is the method of general observation and the second that of experimentation. The former consists in the collection of data by observing the animals in their natural conditions. Such conditions are generally not controllable nor constant and the interpretation of the observer is frequently biased in favor of high intelligence. That is, men who have collected material by this general method have seldom been of a strictly scientific temperament. They were inclined to look for the romantic and unusual, and frequently accepted stories and anecdotes told them, at their face value. It is evident that this method of study can give us neither absolutely reliable data nor material that is in any sense quantitatively correct.

The second method, that by experimentation, attempts to control the conditions and to record the observed facts in an absolutely unbiased fashion. There is no intention to prove or disprove the presence of certain mental faculties but merely to ascertain the actual mental status of the animals.

Let us turn first to those using largely the observational method. - Wallace attempted to prove that the building of nests among birds is not an inherited instinct. He argued that the selection of the material used could be explained by the habits of the birds and the form of the nest,

at least in a large measure, thru imitation. He supposed that the young bird acquired a thoro acquaintance with the nest of the parents and afterward constructed its own nest from its memory image. Groos objects and says that the art of building the nests is inherited, for the young birds become acquainted with the completed nest but not with the manner of ^{its} construction.

Romanes reports in his "Mental Evolution in Animals" that many breeders of canaries are in the habit of substituting artificial, felt nests for those built by the birds. When the young birds are hatched, a new, clean nest is substituted which is also made of felt. He reports that none of these canaries thus raised fail to build their own nests in due time. On the other hand he was surprised to note the wonderful similarity between their nests and those of the wild birds of the same species.

Stories of birds learning to speak words and phrases in imitation of their owners are so well known that their repetition in this place is unnecessary. It is evident that this is imitation of the reflex or instinctive type for the meaning of the phrases is in no sense comprehended.

Scheitlein tells of the dog ~~that he~~ ⁵² that he constantly observes his master, that he always tries to be at his service. If the master picks up a ball to throw at nine pins, the dog also picks one up. If the master is a mineralogist, and walks about looking for stones, the dog also hunts for stones. If the master is digging, the dog also begins to do the same with his paws. If the master sits at the window gazing at the scenery

outside, the dog will jump up to a seat beside his master, put his paws on the window sill and look out (quite unreflectingly to be sure). The dog wishes to carry a stick or a basket because he has seen his master or the cook do this. Hutchinson in his book on Dog Breaking says that dogs may be taught tricks much more readily if they see other dogs performing the tricks and obtain a reward for it.

Mr. Ellendorf tells of a little black monkey which he raised in Costa Rica. This monkey had seen him draw matches from a small match-box and strike them across the cover thus producing a bright flame. This was very interesting to the monkey. It finally took out one match and drew one end (the wrong one) across the cover of the box. Ellendorf placed the match correctly into the monkey's fingers and the monkey again tried to light it and finally succeeded. He seemed very much pleased and excited and immediately grabbed a whole dozen of matches and passed them over the cover of the box until they ignited. 52

H. Leutemann offered an orang- outang a pair of gloves which the animal immediately put on his hands. He had made the mistake of putting the left glove on the right hand and the right glove on the left hand, but he evidently knew what their purpose was. The monkey was further given a cane. He supported himself by it and when it bent he seemed to be in doubt as to the correct usage of the same and began to make grotesque motions with it. 52

Mr. Tuke reports that a monkey will imitate to the extent of selfdestruction, as in an 135

instance in which a medical man who was annoyed by the imitative actions and grimaces of a monkey placed a razor into its hands and then went thru the dumb show of drawing another across his own throat. The monkey immediately imitated the act and with fatal consequences.

Groos observed that "a chick learns to 52 walk in from five to eight hours if its mother helps it, but from eight to sixteen hours are needed if the chicks are separated from the hen as soon as they are hatched." Darwin mentions the common belief that chicks drink wholly by instinct but says that "this is not so, for I was most positively assured that chickens of a brood reared by themselves generally required their beaks to be pressed into a trough, but if there were older chickens present, the younger imitated the movements and thus acquired the art." Lloyd Morgan taught one of two ducklings to drink "by once dipping its bill into the water. The second presently imitated and drank repeatedly".

The experimental method as it has been applied to the study of imitation has not been so positive in its results. In fact the very animals that are popularly believed to be possessed of a very high type of imitation, namely the monkeys, are now credited with but little or no imitation at all by some investigators who have applied the experimental methods.

Thorndike tried to find out whether or not monkeys would learn to enter a puzzle-box any more quickly after having witnessed a number of times how he opened the various fastenings. Several kinds of boxes were used, but the monkeys did

did not in any case make sufficient progress to justify the conclusion that they learned by imitation. Neither did monkeys which failed to learn how to enter the puzzle-boxes after several trials, imitate others which had learned to operate the fastenings. No evidence of imitation was furnished by the general behavior of these animals, but since two of the monkeys were on very ^{un}friendly terms and the third was exceedingly timid, their social relations were not very well fitted to produce evidences of the imitation of one another's acts.

Watson carried on some experiments 143
on a baboon, a Cebus and two Rhesus monkeys. He performed before them certain acts which resulted in securing of food, such as drawing in food with a rake or a cloth, getting it from a bottle with a fork, and poking it out of a glass cylinder with a stick. After the monkeys had witnessed his act repeatedly there was no evidence that they attempted to secure the food in a similar manner to that which they had seen successfully carried out. Experiments with puzzle-boxes in which the monkeys had a chance to imitate either the experimenter or the animals that had already learned the trick gave similar negative results. While they gave no evidence of imitation of a high order, Watson's monkeys occasionally performed acts which were "suggestive of a low type of imitation". One found a hole in a windowframe. "This one would 'peek' and then another would push him aside and peek in turn. This was observed several times."

Kinnaman studied two Rhesus monkeys. 68
He had attempted in vain to teach the female monkey to pull out a plug in order to open a door.

Mr. Kinnaman put rice around the wooden plug and she opened it several times but only once without the rice. Then she became discouraged and would walk away as soon as she saw that the door was shut with the plug. The male who knew the trick was now put in with her and he seized the end of the plug with his teeth and removed it. The box was set again. This time the female rushed to it, seized the plug by the end as the male had done and procured the food. The act was repeated in the same way eight times. The only objection to calling this a pure case of imitation seems to be that the female had really done the trick before and was learning nothing new. So thinks Holmes but it would seem that some amount of acquaintance with the mechanism would be necessary for a case of normal imitation. How could one expect an animal to catch the significance of an act in any way without some previous associations about the (to him) very unnatural performance?

Kinnaman reports another case and describes it as follows: "Recalling that she had failed to work the bear-down lever for opening the box -- I placed it before her. She rushed up but missing the plug she sat down. The male passed her and pushing the lever he procured the food. When the box was set again, she worked the lever and took the food in the same way he had done. She manipulated this apparatus several times immediately and 250 times later as a part of a combination lock". 63

Another monkey, a chimpanzee, is reported by Mr. Witmer to have copied a W twice

which had been written on the blackboard.

One of the most extensive studies on imitation in monkeys is that made by Mr. Haggerty. He used the problem method only. - Animals were placed in the presence of simple mechanical devices, the manipulation of which opened doors, disclosed openings, or dropped food into the cage. The motives for action on the part of the monkeys were curiosity, the tendency to imitate and the obtaining of food. Mr. Haggerty found the main difficulty in the experiment to be to get the attention of the animals and at the same time not to frighten them. "The monkeys were put into a cage in which were mechanical devices^{by} operating which they could procure food. Each monkey was given five trials of fifteen minutes each on successive days. If he did not succeed in procuring food by his own unaided efforts, he was allowed to see another monkey operate the devices and was then allowed to try again. The above mentioned trials were merely preliminary tests and it was found that at the end of those trials the monkey had either solved the problem or else become indifferent".

53

The imitation tests were made on those that failed. They were given a chance to see others doing the task. The lessons were kept up until 100 tests were made before the monkeys were dismissed as a hopeless failure. In many cases monkeys ~~monkeys~~ which failed to operate the devices alone did so after watching other monkeys work them one or more times. The attention of the monkeys was usually stimulated when they saw other monkeys obtain food by working the devices. Very frequently the imitation was not perfect at first, but the various features of this

trick were learned one after the other.

Mr. Holmes considers the interpretation of these experiments somewhat doubtful, since the monkey which served as a model learned the trick without an object to imitate. It seems possible, he thinks, that the monkey which performed the trick after watching him may have learned it at first hand also. This possibility is, of course, always open and we shall never be able to assert with apodictic certainty that an act learned was so learned by imitation. Mr. Haggerty correctly remarks in his discussion that only an accumulation of a large number of instances and careful records of the details of observation will give us more reliable data than we have in the common dogmatic discussions. 59

One record by Mr. Haggerty must apparently be regarded as negative evidence as regards the presence of imitation in monkeys. A cage was arranged with a chute extending into it down from the ceiling. A string with a weight was inside this chute. The pulling of this string opened a trap-door in the ceiling of the cage and dropped peanuts into it. Two monkeys were used and at the fourth trial number II jumped to the chute and worked the device and later repeated it, learning it well. Number I. did not learn it by himself and seeing no. II. do it over 200 times he did not learn the trick. Only by the experimenter's placing a stick from the wall of the cage to the chute, on which No. I. would play, did he finally learn this method of opening the trapdoor and securing the peanuts. His performance was however never as skillful as that of Number II. 53

Mr. Small reports in his experiments 118

with rats that the young white rat reaches maturity about the twenty-fourth day. On the twenty-third day he observed a young white rat watching its mother draw in excelsior to build its nest. Soon he did it in the same way the mother did it and stopped when the mother stopped.

Mr. Berry also studied the imitation 19 &
of the white rat. He writes: "We found that when 20
two rats were put into the puzzle-box together,
one rat being trained to get out of the box and
the other untrained, they at first were indifferent to each others' presence, but as the untrained rat observed that the other rat was able to get out while he was not, a gradual change took place. He would watch the movements of the other closely, follow him and pull the string after he had pulled it, etc. We also saw that when he was put back, the immediate vicinity of the loop was the point of greatest interest for him and that he tried to get out by working at the spot where he had seen the trained rat try."

"In the light of this" Berry concludes, "imitation in white rats has been conclusively established." But the question that still remains to be answered is whether this is imitation of the voluntary, the intelligent or the instinctive automatic type. Mr. Berry maintains that these are instances of voluntary imitation of the monkey grade of intelligence. He will work in parts where he has seen others open the door. The writer says: "Observation of another rat plus the experience of practicing the movement constitutes imitation".

Mr. Berry also performed a series of nine distinct experiments with four cats. By M he designates the mother and by X, Y and Z the three kittens. Y was a male, the others were females. Meat was given them as a reward for the successful performance of tasks set for them and before the tests for imitation were made, opportunity was given them to learn by their own initiative. The task in the first experiment was jumping from a box to a table. Much hesitation was shown by the kittens until M had been seen doing the task and Y did not muster courage to do it until the other two kittens had jumped.

"In experiment IV." Mr. Berry writes, "M refused to turn the button until she had seen X turn it several times and get meat. Her failure was not due to lack of hunger, for after she turned the button once she continued to turn it as fast as I could put the meat in and close the hole. It was not instinctive because she did not scratch at it when she saw X do it. M. simply did it successfully and to all appearance intentionally after having watched X. do it and get meat". Mr. Berry considers this a fair example of voluntary imitation.- In another experiment of the same series Y refused to roll a ball into the hole until he had experienced the results that came from the act. It was then and not until then, that he began to roll the ball and watch the door. Again, X. did not kill or even seize a mouse when an opportunity was given her until she had seen several mice killed and had eaten two that had been killed by others.

Berry says, "The fairest way of inter-

pretending these cases is to admit that they are instances of voluntary imitation of a low order."

It was not voluntary of a high order because imitation did not occur until the act had been observed a number of times. However, the facility with which an animal will imitate depends very largely upon how closely it attends to what the trained animal is doing. In voluntary imitation the motive for the act is not merely the sight of the activity of the animal imitated but of the results, such as food, freedom, etc. But in instinctive imitation the animal sees and then finds itself performing the act.

^{very important} Instinctive imitation has come to be considered ⁱⁿ the mental development of animals. In his experiments with the cats mentioned Mr. Berry found many instances of this type of imitation. In experiment II. Z saw X pull at the knot. She went to it, seized it and pulled hard enough to open the door. After the cats were fed and put back into the box Z pulled the knot first, X then tried it and after she had tried and stopped, Y tried it and pulled hard enough to open the door.- It was thru instinctive imitation that the cats learned to get out of the box. X was the first cat to find the knot, yet it was Z imitating X who opened the door. The next time Y opened the door after Z had pulled the knot and when they were put back for a third time, Z went directly to the knot and opened the door.

Aside from its immediate value in itself instinctive imitation is also important in that it leads up to voluntary imitation. After the first act of instinctive imitation the act is no longer the same. Either it becomes more automatic immediately or else

a transition to voluntary imitation occurs, i.e. in all of these acts but the first "the imitator either looks on or participates in the act with a knowledge of the end to be attained."

Both Davis and Cole experimented on raccoons to determine thier imitative tendencies. The evidences are very largely of a negative character. In some cases the interpretation is doubtful. One raccoon used by Davis sat up to take her food and a second one soon took the same position, but dropped this method resuming it again three weeks later. "Anther jumps three feet high at the present time," he writes, "to get his food. He is in the midst of the pack when he jumps but no other animal has copied his method." No inferential imitation whatsoever was noticed in his experiments and observations, nor was there any conclusive evidence for imitation of the instinctive character. Cole, too, draws similar conclusions from his observations. He writes: "The animals do not imitate one another nor do they pay any attention to each other except when playing or fighting". They seemed to acquire an impulse to do an act from sæeing the experimenter do it. For example, the coons picked the right card after seeing the experimenter do it, if the box opened afterward as a result.

In his book "Instinct and Intelligence", Wasmann names instinctively imitating the behavior of surrounding beings as the lowest type of learning by foreign influence. He says that this type of learning is prominent in animals of social habits. He finds many instances

in ant-life. This animal seems to have been his favorite subject. When one or a few ants commenced to pursue the Dinarda Beetle which met them, their example soon proved so catching that many of the others, masters as well as slaves, who had not happened to meet the unfortunate beetle or had even ignored it previously, began to hustle in search for the intruder. It is in their attacks upon enemies that imitation in ants is especially marked. An attack by an ant is the signal for others to join in the fray. "Sometimes a strange ant may be tolerated in a nest until it happens to arouse the animosity of one of the members, when various others fall to and help to dispatch the intruder." Wasmann states that slavemaking ants readily adopt guests which are received in a friendly manner by their slaves, altho they would otherwise be apt to attack them, and slaves in turn are disposed to be friendly to the guests which they perceive to be tolerated by their masters.

The feeler language of the ants is dependent of the instinct of imitation. Naturalists have very generally given undue credit of intelligence to ants on account of their apparent ability of communicating with each other. Wasman however believes that the result of the ants' tapping one another's heads consists chiefly in arousing the attention of the others and then having the others follow and take part in a given enterprise.

A similar kind of imitation may be observed in fishes. In those species of fishes which run in schools the turning about of one indi-

vidual generally causes all the others to turn. Each individual has an inherited tendency to follow the movements of the others and by virtue of this trait the fishes keep together and escape common danger.

Imitation seemingly plays an especially important role in the life of birds, as has already been indicated in a previous paragraph. But it is deserving of more careful consideration at this point. Morgan has expressed the opinion that the song of birds is not wholly a matter of imitation. He believes that there is some congenital tendency to sing true to type, yet he agrees that imitation as an important factor may be considered as an established fact.

C. A. Witchell's observations go to 147 &
show that the call-notes of the fowl, the pheasant, 148
the turkey, the partridge, the duck and the goose
are inherited and are used upon appropriate occasions
even if the birds are artificially reared. The song
of birds is probably very largely made up of call-
notes and danger/cries. Witchell thinks that in bird-
song imitation is very prominent. They imitate other
birds, insects, quadrupeds and sounds produced by
the elements. The tones of the owl are an imitation
of the wind moaning in hollow trees where these
birds reside. Pelicans, Flamingoes and Herons have
voices resembling the croakings of frogs and toads.
The wrens' twitter imitates the trickling of water
and the songs of other birds resemble the murmurs
and gurglings of rippling streams. The cry of the
ostrich is like the roar of the lion. The squirrel's
alarm cry and that of the snake each is like the
sounds they produce in rapid retreat. The former is
like the swish of a long twig, the latter like the

rustling of dry grass.

Mr. Scott reports that two Baltimore orioles¹¹⁰ which were left altogether to themselves sang a song of their own while their call notes were similar to those of the wild species. Other young orioles placed with these learned only their notes. Bobolinks and redwinged blackbirds which were kept alone had songs that could not be recognized as belonging to these types of birds, while the call notes of the red winged blackbirds were like those of their species. It appears that call notes are more clearly subject to inheritance than song.

As early as 1773 Darrington trained a sparrow under a linnet and a goldfinch and he learned a mixture of the songs of the two. Sterland reports a sparrow that learned the song of a skylark.

Conradi attempted extended experiments with young sparrows. He placed sparrow eggs under canary birds but failed to secure any birds with which to experiment. He took one young sparrow from its real parents when a day old. It developed its sparrow chirp when calling for food altho it heard only the peep of about ~~about~~ twenty canaries that were with it. By and by it gave the chirp less frequently and the canaries' peep oftener. After about two months the sparrow chirp became rare and lost its harshness. About a month later the tendency to imitate the song of the canaries suddenly appeared. The sparrow chimed in with them in its own fashion. After a few days he became ill and dropped these attempts. But when he recovered, he joined them again in a confusion of notes which resembled the confusion occurring^N when three of Conradi's canaries were singing their best. When nine months old this sparrow was removed from the can-

ries and soon lost their song completely. Two other sparrows nine months old not only imitated some of the songs of the canaries but also their call notes. When they were removed and heard only sparrows they dropped back into the ways of a sparrow very rapidly, but upon renewed instruction quickly regained all they had lost.

A few years ago J. M. Porter carried 89 on very valuable experiments at Clark University concerning the intelligence and imitation in birds. They are valuable chiefly on account of the methods used and the criteria of imitation employed. Mr. Porter distinguishes thruout his work between intelligent and reflective imitation. By the former he means, as was indicated in the introductory portion of this paper, a 'profiting by experience' kind of imitation and hence 'intelligent imitation' must be kept apart from the words which indicate the presence of reasoning.

Mr. Porter points out that smell seems to play a very important part in guiding most animals in their activity. Since birds have their olfactory lobes very slightly developed and depend on the sense of smell to a very small extent, they seem to be good subjects for the study of imitation because it is difficult to exclude all the odor-clues that the imitator might leave behind in experiments in imitation. The sense of sight is very important with birds. Edinger showed that the keenness of vision, the large eye and the optic lobes enable them to see accurately and from afar. Our apparatus for the study of birds should then be devised to appeal especially to the sense of sight. Mr. Porter accepts the evidence of other investigators for the importance

of instinctive imitation to birds. Bird migrations, gregariousness and the experiments particularly concerning bird-song sufficiently support the existence of this type of imitation. Mr. Porter performed his experiments to determine the existence or absence of the higher forms of imitation.

For a comprehension of his results a description of his method is required. In all his experiments he used a small box inside a large cage. The cage was lined with white muslin to secure favorable light for photographing. The camera was concealed in an inverted box on the floor of the large cage. The motive was always the desire to secure food but extreme hunger was avoided. The door of the puzzle-box which contained the food was opened by pushing or pulling in any direction any one of the four strings stretched across a notch to the right of the door. In successive experiments the position of these strings was shifted. Before individual birds were experimented on they were fed for some time in the puzzle box. Then the food was placed inside the box just beyond the wires and the door closed. For his experiments in imitation Mr. Porter never confined his birds while they were watching others opening the door.

Mr. Porter believes that the changes of the location of the strings are splendidly fitted to put to a real test the intelligence and the power of analysis in animals. To meet a slightly new element in a situation well known generally is the crucial test of intelligence. The criterion of imitation of the intelligent kind as used by Mr. Porter is the ability of one individual to change his own method for that of another.

The way of learning which is distinctively the animal method is the 'hit and miss' or 'try, try again' method, success being purely accidental. The simplest and most direct act is gradually selected. The successes are followed up by reason of the rewards or the pleasure which they bring. The number of efforts and not the time spent is the best measure of the learning process.

In one of Mr. Porter's early experiments he used two English sparrows. The female soon learned to pull the string to the right of the door of the puzzle box successfully. The male was less active. After some days the female seemed to be in poor health and the male opened the door with good success. Porter says that this "seems to be imitation".

In another experiment the male sparrow mentioned above and a female cowbird were alone in the box. They alternately opened the door. But the English sparrow found it possible to open the box after the location of the strings had been changed to the end only after he had seen the cowbird do it. The sparrow had acquired intimate acquaintance with the mechanism and now imitated a similar act under slightly changed conditions. Mr. Porter would call this a case of intelligent imitation for he believes that we must allow the animal some acquaintance with the box and the mechanism before we can expect such intelligent imitation.

In another experiment a sparrow and a junco were used. The former was decidedly the master in the cage and monopolized the manipulation of the strings. Upon one occasion the sparrow again held the strategic position on the lowest string but in her depleted condition she was un-

able to open the door, hesitating, making starts etc. "All the while the junco with open beak is uttering the most plaintive notes and would act at once if given the opportunity. Finally the junco really shows signs of fighting. It would seem that such might be a favorable condition for the appearance of imitation." At any rate "the junco now rapidly learns to do the act".

In a pair of blue jays Mr. Porter observed very musical voices. He explains, "It is said that much of it comes from the imitation of musical instruments like the mandolin, the guitar and the violin, all of which they have much opportunity to hear. However uncertain this may be, I have never heard such notes by jays in their natural haunts. I doubt if many other birds can surpass such low, sweet, metallic notes as these were wont to put together in the most pleasing way."

In still another test oriole Number I. had opened the door in his usual manner (by reaching the beak thru the wire mesh and pulling the threads). Oriole No. II. then made many of the same kind of efforts as Oriole No. I. had just made, but the latter was inside and the door was open. "Such imitation can hardly be called rational or reflective. Intelligent it may be."

Jim, an old crow, and Young Crow No. I. were the subjects of another experiment which brought what Mr. Porter considers his best results on the subject of imitation in birds. He says, "Instead of opening the door as I meant for him to do ~~stem~~ Young Crow No. I., after about a dozen efforts, put the beak thru the wire just to the right of the door in front and pulled one of the strings running vertically from the latch to the under surface of the top of the box." The

crow then jumped on the open door and by hopping off he chanced to close it. Thus he made possible another test at once after Jim had seen him open the door from in front. "In spite of the fact that Jim had shown strong inclination to go to the left end he now made most of his thirty efforts on the front and really succeeded in opening the door in the same way as the young crow had done." It would seem that in the above series of experiments with the crows there was the proper conjunction of just those facts that are needed to call forth imitation.

Jim did not simply perform an act in the same way as his model did but he was seen to go against an old habit. He did so probably because previous methods of his own had brot the desired result. Where could the idea or the impulse of the movement to be made in imitation come from if the animal or the child had had no previous experience of its own to use at least as a basis?

That this previous experience has not been given to animals by earlier students of imitation is the criticism Mr. Porter has to make of former experimental studies of imitation.

A further word is needed on ^{the} methods now employed in the study of imitation in animals.

The nature of the two general methods of 'observation' and 'experimentation' has already been discussed. The great advantage of the former is, of course, the naturalness of the conditions in which the animal is allowed to react, undisturbed by any artificialities whatsoever. There is freedom and naturalness in all the actions.

Nothing in the inner states of the animal is inhibited, no functions are disturbed by conditions absolutely foreign to the natural state of the organism. But the advantages of 'experimentation' cannot here be secured. Control over circumstances and influences and the possibility of exact, systematic observation with complete records can be had only in the necessarily more artificial 'experimental' study of the animals.

To use both methods combined, one checking the other, will undoubtedly bring us nearer the truth than any one alone. Yet the study of animals under carefully controlled conditions should be made as natural as possible, excluding all occasions for fear and securing the greatest obtainable freedom and well-being of the subjects.

Dr. Thorndike's methods and conclusions have been very stimulating to other students of animal psychology. They have been so radical that many have come to the rescue of animal intelligence by criticizing his methods and in some cases (e.g. J. P. Porter) by attempting to improve upon them. In his experiments Dr. Thorndike had the imitator (cat, dog, chick or monkey) in the puzzle box and the imitatee caged in another box where the animal could observe thru a screen what the other was doing. Thorndike thinks that in his experiments "imitation, if present, will surely come forth". It is certainly a just criticism to say that his method was very unnatural and that therefore his experiments prove no more than that "his methods showed no signs of imitation in these domestic animals". His methods played on the mo-

tives of hunger and the desire for freedom. In many cases it is evident from the words he uses to describe the behavior of the animals that fear was present.

It is very probable that all imitation of the higher type (higher than purely instinctive) requires entirely natural and unstrained conditions. Mr. Kline and Herr Groos emphasize the fact that the activities of imitation and those of play are very intimately connected and that both find their fullest expression under similar conditions. These conditions are just the opposite of those created in the experiments of Thorndike; viz., freedom, security from harm, satiety, in a word, wellbeing. "Nothing so shrinks and inhibits the fullness and the variety of an organism's activity as prison life and fear. To get a particular tone from an instrument you must play certain definite keys. Dr. Thorndike played the wrong keys."

Aside from the obstructions to good observation another grave objection to the method of keeping the animal that observes in a separate cage may be mentioned. There is necessarily a break in the time and an interruption in the attention of an animal when it is taken from its place of observation to the experiment box. This break is probably far more serious for organisms of a lower grade of intelligence than it is for man. Since interest and attention and memory of the ideational type are but slightly developed in animals, they should not be too greatly taxed. At least the first threads of association between 'the act observed' and 'the act performed' should have an opportunity of establishing themselves

without requiring the memory to carry an idea over a time gap. Mr. Porter's 'most conclusive evidence for the presence of intelligent imitation' quoted above occurred when the crow, Jim, by chance had an opportunity to imitate immediately.

The matter of devising better methods and of getting at the facts is at present of first importance for the advancement of animal psychology and certainly of our knowledge of the nature of imitation and its function in the life of animals. To interpret the data collected is, of course, essential if any use of application is to result. Also for the purpose of stimulating the interest and guiding investigations theories should be set up and defended. The checking and correcting of one-sided interpretations can be brought about only in this way.

Such a general consideration of the literature on imitation below man justifies us in drawing some definite and a few tentative conclusions:

1. Mimicry certainly exists in animals but it does not imply any intelligence properly so called.
2. Instinctive imitation is a factor of very wide importance in animal behavior and may in some cases lead to the next higher type.
3. Intelligent imitation arises in close connection with interest in the doings of others. If used as indicating that type of imitation which implies the "profiting by experience" grade of consciousness, it evidently occurs in a

number of animals below the primates.

4. Voluntary or intentional imitation may exist in isolated cases below man but all reliable data, tho this is rather meager, supports the opposite view: viz., that animals below man do not reflectively imitate.

II. In The Child.

A study of imitation in the human species is not fundamentally different from the study of the same phenomenon in the lower animals. Yet we shall find that the particular acts of imitation which have been made the center of inquiry by investigators in this field are not precisely the same as those that have been studied in the animal. The center of gravity has shifted somewhat. Also the method of study is different from the method which has been widely employed in the study of animals. This must necessarily be so, for altho the lower animals may be subjected to well-nigh determinable conditions and situations in which all factors are under control, the human being cannot be so placed for sentimental, humanitarian and other reasons. The method of study then must be predominantly observational here while the more exact experimental method is more easily applied in the study of lower animals.

The object of the inquiry is however essentially the same type of activity but appears here under more favorable circumstances that permit of its higher development. The functions and fruits of imitation can be clearly seen in the more favorable soil of human physical and mental actions and therefore a discussion of the importance and the function of imitation is taken up in the last part of this paper.

One characteristic that distinguishes 42 mankind from the lower animals may here be pointed out. The truth of this distinction may then

be observed as we cite particular cases of imitation in man. Both have the instinctive tendency to imitate. While this remains a mere disposition in animals it tends to become a faculty in human beings. In the latter it has the tendency to become a tool under more or less conscious control of the possessor while in the former it remains more purely impulsive and spontaneous. When once this instinctive tendency has been elevated to an ability, the step to evident originality in action is short. That such a direct relation between imitation and originality exists will be the subject of further discussion after a variety of imitative acts have been reported.

As a preparation for a better statement of the meaning of imitation, as well as for a more comprehensive definition of the term, a somewhat inclusive list of observations must be given. It is important that the earliest date of imitative acts in children be ascertained, for in as much as the development of imitation is intimately bound up with the rise of other mental powers, a valuable contribution to genetic psychology may here be anticipated. Preyer asserts that the most insignificant imitative movement furnishes a sure proof of activity of the cerebrum and hence of ideational experience. This writer analyzes the imitative act into - first, perception thru the senses; second, the having of an idea of what was perceived; third, the execution of a movement corresponding to this idea. The further assertion that "the first time an imitative act must have been executed with intention, i.e. voluntarily", as well as contradictory statements by other writers indicates the importance of a determination of 'earliest imitative acts'.

In the discussion of this report which deals with the meaning of imitation actual cases of imitation must naturally be referred to. To secure a background for all further discussions, as well as to lend to our whole subject a greater human interest, the following list of observations of imitations is presented.

1. Preyer reports a protruding of the lips 92 movement in his child from the tenth day of life on. "Altho opportunities to imitate were frequently given, the first signs of actual imitation appeared at the end of the fifteenth week. That it was a case of imitative movement was shown by the imperfect character of it in comparison with the perfect pursing of his lips when he did it of his own accord. Not until the seventh month were the attempts to imitate movements of the head and others so striking that I could no longer refer them to coincidences.- In the tenth month correct imitations of all sorts of movements were frequent and it is certain that these were executed with distinct consciousness; for when he is imitating movements of the hand or the arm frequently repeated before him- e. g. beckoning and saying "tatta"- the child looks fixedly at the person concerned and then often suddenly makes the movement quite correctly.- Beckoning (Winken) is in general one of the movements of the infants acquired early by imitation; In my child at the beginning of the tenth month."

2. A little girl before the end of the first year imitated the parking of a dog and the

bleating of the sheep. (Frau Dr. Friedmann). Another female child imitated the following movements in a recognizable manner: - In the eleventh month she threatened with the finger if any one did so to her, used a brush after she had seen brushes and combs employed, used a spoon properly and drank from a cup. In the thirteenth month the child made the motions of sewing, of writing and of folding her arms. In the fifteenth month she fed the doll as she was fed herself, imitated shaving on her chin and reading aloud, moving her finger along the lines and modulating her voice. (Frau von Struempel).

3. One child in the tenth month had 134
learned to imitate the movement of beckoning, but he showed by the expression of his face and the attendant gestures that he did not in the least comprehend the significance of the beckoning.- New movements and complex ones were not always imitated at the end of the first year.

4. A child of eight and one half months having seen his mother poke the fire afterwards crept to the hearth, seized the poker, thrust it into the ashpan and poked it back and forth with great glee, chuckling to himself. Another child in the tenth month imitated whistling and later the motions accompanying the familiar "pat-a-cake", etc. In his eleventh month he used to hold up a newspaper and mumble in imitation of reading.- Another boy eleven months old used to cough and sniff like his grandfather and frequently amused himself by grunting, crowing, gobbling, and barking in imitation of the domestic animals and birds.

5. Mr. and Mrs. Stern relate: "In the seventh 123 week our little girl, Hilde, occasionally uttered sounds of pleasure or comfort after being fed. These sounds were similar to *krä-krä*. When two months old 'erre, erre' was added and in the eleventh week these babblings became more frequent and permanent. They were evident signs of comfort. We observed the following with certainty since the beginning of the eleventh week. If, when the child is in good humor, we repeat its sounds, 'erre,erre,' to it, it frequently reacts by repeating the same with a great deal of strain. The imitative effort now caused the child to become red in the face while at other times the sound is spontaneously produced without any signs of exertion. Coincidence is excluded, for the experiment was often successful when the child did not utter the sounds immediately before or after. The impression on us was that of a voluntary and successful imitation. A few weeks later we got similar results with the syllables '*krä-krä*,' which Hilde had not uttered for several weeks".

6. Stern's child, Günther, reacted with an oft repeated similar sound when *ä* was uttered before him. In the eighth month he succeeded in differentiating the imitative activity. To the single sound *ä* he reacted with a single *ä*. If the stimulus was given twice, *ä ä*, he reacted *ä ä*. One month later (ninth month) his imitative activity was much stronger. He imitated without great exertion when mama, papa, dada, jette (ette), a peculiar laugh, *ä ä ä ä*, etc. were offered as models.

Miss Ellen M. Haskell has collected over 107
 twelve hundred "Child Observations" on imitation
 and allied activities, which were made mostly by
 students in a normal school for the avowed pur-
 pose of bringing them into direct and sympathe-
 tic touch with child life. These observations
 do not pretend to be scientific and we must there-
 fore await their careful corroboration before they
 are accepted as evidence for any particular and
 definite conclusion as to the origin, nature and
 value of imitation. There is however but little
 more scientific material available, and in the
 absence of such we can hope to establish only
 certain more or less general facts concerning
 this important instinct. Many hints for further
 study and for a preliminary formulation of the
 facts of imitation can be culled from such obser-
 vations. They deserve our notice here.

7. Bertha. Age, one year.- Bertha's mother
 dips the comb into the wash-basin when she combs
 Bertha's hair. If Bertha is given a comb, she
 strikes the edge of the basin with it, but puts
 it into her mouth as often as to her head.

8. Arthur. Age, one year, five months.-
 Arthur gave the cat a share of his bread and butter
 and wiped the cat's mouth with the napkin.

9. Mary. Age, one year, eight months.-
 I curled Mary's hair with a curling iron. A few
 days later I found her with the iron, trying to
 curl her hair.

10. John. Age, two years.- It was the
 custom for Mr. Blank to ask a blessing at the
 table. One day when Mr. Blank was absent John
 bowed his head and mumbled something for a few

seconds.

11. Evelyn. Age, two years, one month.- Evelyn's father was playing with her. He rapped on the table and said, "Walk in, walk in!" Evelyn rapped and said, "Alk in, Mr. Cosby!" Her father's name is Crosby.

12. Margeret. Age, two years, two months.- Margaret saw her aunt cut her corns, after which act she walked slightly lame. Margaret was seen limping and when asked what the matter was, she replied, "Oh, my corn!" At the same time holding her foot with one hand.

13. Jessie. Age, two years, six months.- Jessie was playing on the sidewalk with two other children. As I passed I heard her say to Frank, "Come And see my baby; she's awful sick". She showed him a little mound of sand with a tin box-lid partly buried in it.

14. Herbert. Age, three years.- Herbert had seen an organgrinder and his monkey. Herbert put on a fancy cap and placed the sewingmachine cover on the lounge. He sat silent on the cover for a few seconds, then jumped down and passed his cap for cents.

15. Mary. Age, three years, six months.- Mary has lately taken a fancy to change her name and does it frequently. She wishes to be called by the name she assumes. She is not well acquainted with me and asked her mother to tell me that her name was Bill now.

16. Thompson. Age, four years.- I heard Thompson running in and out of the yard early this morning and saying to himself, "Whoa! get up!" I then heard his mother call him to breakfast. Instead of coming in he said, "I aint him,

"I'm a horse!" His mother called him again and he said, "I aint me, mamma. I'm a horse."

17. Frank. Age, five years.- John. Age, four years, three months.- Frank and John played together for two days. Most of the time they were peddlers. Now and then I heard them arranging for a new game, but every game seemed to drift into buying and selling.

18. Several children. Ages, four to six years,- I saw several children hopping about under some low shrubs making a peeping noise like chickens.

19. Unknown. Age, six and seven years.- Several children were playing "house" on the sidewalk. As I passed one child said, "I came to visit you and have brought my child." To which the hostess replied, "I am sorry; they are so noisy that they make me nervous. I detest children".

20. Cora. Age, about eleven years.- She says, "I had learned at school that Quito was on the equator and could be reached by going around Cape Horn. We used to take our dolls with all their thinnest clothing and play go around Cape Horn. Icebergs used to come very near the ship, but they never struck it. It seems to me I can remember feeling genuine fear lest they should strike it."

The fact that an ulterior motive sometimes plays a larger part than the imagination is well illustrated by the following case:

21. "A little boy in one of our first grades 137 complained of stomach ache. The teacher very ready for emergencies, gave him a small dose of peppermint. In a short time several children were suffering severe pain of the same nature."

The variety of things one child will imitate and the individual differences as to the objects chosen for imitation are well instanced by two other observations.

22. "Henry, an especially interesting child of eight imitates in his home- different forms of prayer; reading or pretending to read books or papers beyond him; the silliness, ways of walking, the slang and the modes of speech of his companions, especially of the larger boys; the teacher's ways, by trying to get into deep arguments like older people; staying in the house instead of playing outside because older people do so. He also imitates people's ways of studying pictures.- A younger brother, whose environment is precisely the same, imitates a man of business, a carpenter, large boys in their sports, older people's ways of reasoning."

Even in fairly complex cases of imitative acts the child is often unconscious of the fact that any movements have been made. The power of observation seems to be quick but the mind does not appear to act. Thus:

23. Leah has a peculiar motion of the head in walking, especially when walking about the school-room. Floyd, aged six, makes the same motions as he watches her.- Often when the children are singing too fast or too slowly, I mark the time by a movement of the hand. Don invariably makes the same motion and seems unconscious that the other children do not. - I noticed a little boy of perhaps five and a girl of four playing in the street. The boy gave his sled a push and said, "Oh, it's running away. I must catch it." Immediately the little girl did the same and said in exactly the same tone and with the same emphasis, "Oh, it's running away. I must catch it."

In other cases more mental power is exhibited. It is as if a large association-complex were touched off and a fuller realization of the meaning of the acts imitated had been reached. The instances here quoted are of children under five years of age.

24. Kate, aged two and one half years, rocked her new doll to sleep and laid it on the bed. When she took it up after a very short nap, she drew her little chair near the stove and warmed dolly's feet.- A young man in the house is much affected by the numerous passages in his readings and will smile and often laugh heartily. My little boy, quite unable to read, will hold a book in front of him and seem to be reading, going thru all the motions smiling, laughing and being so thoroly interested in what he is doing as to be quite unconscious of the presence of the members of the family when they gather to watch him.

A third group of cases indicates still more clearly than the instances thus far quoted the distinctly socializing tendency in early imitation.

25. Little Mary is quite a favorite with the children. During one session of school she kept her neck-handkerchief and wore it about her shoulders. It was evidently thot to be the proper thing to do as three other little girls wore theirs in the afternoon. The next morning it had become a fashion, even two of the boys wearing their handkerchiefs over their shoulders.

And again the imitation of "school", "church", "funerals", etc. shows the same trend

and influence.

26. At about the age from seven to nine the 'funeral' imitation takes on a decided form of solemnity. One instance may here be quoted: 137
 "The funeral was held in Eaton Rapids and is true in every particular. It was witnessed by several grown people and the proceedings were written out by an eye witness. The deceased was Mary's white rabbit, which met it's death in a most tragic way, as the account shows. Anna wrote her sermon and no one saw it or knew of its being written until it was delivered. Mary, chief mourner, was seven years old and Anna, the minister, was nine.

"This was the program: - Singing by the choir, Gospel Hymns No. 50. - Reading by the pastor, Psalm 143, eight verses. - Sermon as follows:- 'Dear beloved brethren - you must excuse me for not having a text to preach from, but having been called upon by the stricken friends of the dead, I was informed that I could have only a day and a half in which to complete my sermon. I will therefore just say a few words of consolation to the mourning friends whose grief has been all the greater on account of the fact that the dead died from coming into contact with an ugly dog or cat and that the dead would not have died at that time if the dead had stayed at home and minded its mother, but we hope that its spirit still rests at peace in Heaven; for we think this is the only mistake worth mentioning ever committed by the dead, and we hope that its soul, like its body, is pure and spotless as snow. And I beg of the friends not to grieve

because one more soul has solved the great mystery of life and entered the gates of heaven, but to look forward with glad hearts to the time when you shall meet on the other side of the river of life. -So live that when thy summons comes to join the innumerable caravan That moves to that mysterious realm where each shall take his chamber in the silent halls of death, Thou go not like a quarry slave at night, scourged to his dungeon, But sustained and soothed by an unfaltering trust, approach thy grave, Like one who wraps the drapery of his couch about him and lies down to pleasant dreams.- Let us pray:- Our Father in Heaven, We thank thee for thy many blessings and we pray thee to take that soul in at the gate of heaven. Comfort the stricken friends of the dead and help us all to live better lives and make our souls white as snow and at last bring us all safely in at the gates of heaven.'- Singing by the choir, Hymn No. 118. - The audience was then allowed to view the remains which were next taken and interred in the new cemetery.- The above program was carried out with great solemnity. There were about twenty children present and there was not one but entered into the spirit of the service and there is no doubt but that the affair to them was very real." Is there ^{anything} so beautiful in this world as the sweet, happy unconsciousness of a little child?

It is evident from such records of actual imitations as have just been cited that the method used in securing such data is predominantly that of observation. The experimental method,

strictly so called, has not yet been employed to any considerable extent in the study of imitation in the human being. The reason for this is clear. It is the extreme difficulty of devising a method that will satisfy two apparently incompatible demands. One is that the conditions in which the subject is placed be absolutely determinable and controllable by the observer; the other is that the rights of the individual as a free human being shall not be interfered with. Popular prejudice as to what constitutes interference with the rights and the freedom of the individual undoubtedly is a preliminary difficulty which must be reckoned with.

The fact that all imitative acts, except perhaps the purely rational type, are to a very large degree spontaneous and unconscious prescribes certain conditions of observation. Whatever method is used in securing data on the matter of imitation, it is a fundamental axiom that complete freedom and unrestraint on the part of the child be secured. A corollary of this proposition is, of course, that the child must be completely unconscious of being the object of special interest and attention. Otherwise the naivité of the child is interfered with, the delicate machinery of imitation is thrown out of its normal course and the results cannot be taken at their face value. Usually imitation will be checked and under certain conditions it may be abnormally exaggerated if the child becomes conscious of its being observed.

After a statement of some of the important facts which we may deduce from an observation

of the phenomenon of imitation in general, a brief return to the psychological conditions of imitateness will be desirable.

At this point a few conclusions may be stated:-

First, - As to the rise of imitation the conclusion is warranted that evident instances of it occur about the middle of the first year, but that isolated cases appear much earlier in some individuals as is instanced by the observations of Preyer and Stern. (Observations 1 and 5 above). These instances of imitation in the child increase in frequency, variety and complexity until at the age of from two to twelve years they occupy a supreme position among the sources and ^{the} means of acquiring new reactions ^{and} information.

Second, - The earliest imitations are always movements which the child has spontaneously performed before.

Third, - First imitations by the child are slower and more difficult than the same actions spontaneously performed. (See 1 and 5 above). This indicates the introduction of a new element into the mechanism of action. Preyer insists that this new element is the will. He says, "The first time the imitative act must have been executed with intention, i.e. voluntarily." At any rate there appears a far more finely coordinated connection between impression (idea?) and expression than in the child's previous reflex movements. Whatever else it may mean, it undoubtedly does mark the opening up of large possibilities of learning.

Fourth, - The observations of Russell indicate whom the child imitates. There is a small

92

107 &

48

percentage of imitation of things, e.g., and engine. But according to the charts below, which have been worked out by Caroline Frear, the proportion of imitation of adults is far in excess of imitation of other children or of ~~other~~ animals. It is doubtful however whether a haphazard collection like that upon which these charts were based, represents the facts truly. Interests and prejudices of the observers (who in many cases were brothers and sisters or parents) as well as conditions of observation may have produced a strongly biased list of acts of imitation. Children's imitation of adults is shown to increase with years, while that of imitation of children decreases. This may be a tendency that will be borne out by further investigation. If it is true, it is pedagogically very important. (See Chart I.)

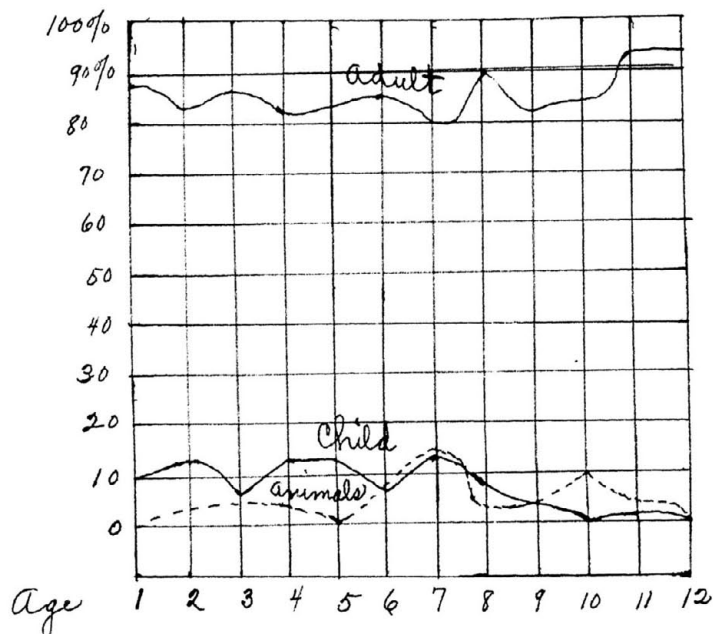


Chart I.

Fifth,— The direct or immediate, i.e. the more instinctive imitation decreases with age, while the playing-imitation, which evidently requires greater imagination and motor control, increases with age. The former is illustrated by the example in which the pupils bobbed their heads as the teacher did in indicating the rhythm of a new song to them; the latter by the girls' playing 'House'. (See Chart II.)

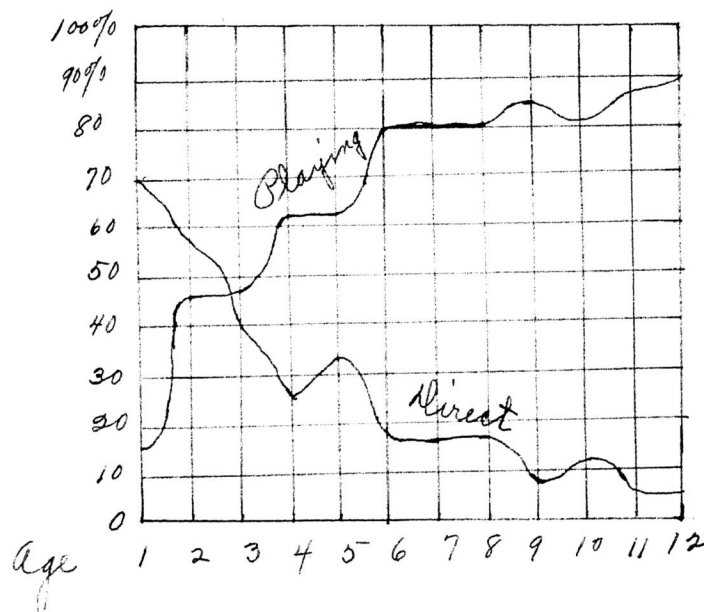


Chart II.

Sixth,— There is a preponderance in early years of imitation of action over that of speech as is shown in the following chart made out on the cases of playing. (See Chart III.)

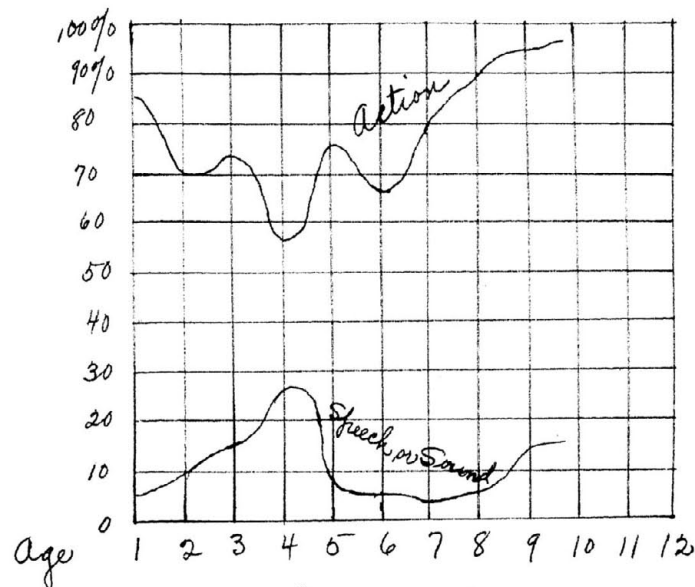


Chart III.

Many desirable and more definite conclusions must await further careful study of the phenomenon of imitation. What is most needed at the present time seems to be scientifically accurate information in order to work out the details of an instinct that is clearly very fundamental in the development of a human individual.

Altho all cases of imitation thus far quoted have been taken from child-life, it must not be supposed that imitativeness disappears with oncoming maturity or old age. "Imitativeness remains with us thru life. It attracts less of our conscious attention in our adult years, but it is present in ways that the psychologist

is able to observe even in cases of people who suppose themselves not to be imitative."

Let us now turn to a brief consideration of the conditions under which imitation will appear and next to an analysis of the imitative act itself. To keep the two absolutely separate will be impossible.

In a genuine imitation there is always some degree of consciousness (idea) of a model which is carried out (modeled after) in some form of response. The tendency of every state of consciousness to result in a motor response probably underlies all organic activity. The carrying out of an idea that enters the mind is however dependent on several conditions. The most important one is the absence of conflicting ideas, which depends largely on the number and the kind of associations one has with an idea and the amount of attention fixed upon it. A lack of a developing attention often prevents conflicting ideas associated with the presented model from coming up to interfere with its being carried into action.

Children have fewer associations than 127 grown people and their attention is more easily attracted. Their tendency is to carry out into action at once anything that attracts them and therefore children are considered more imitative than adults. But as we have seen above in our quotation from Professor Royce "imitativeness remains with us thru life, altho it attracts less of our conscious attention in our adult years."

Imitation assumes a notable form

in excited crowds of people. Such crowds have been labeled by the term 'mob' which designates "any company of persons whose present set of brain involves an abandonment of such choices as have determined their customary individual choices and the acceptance for the moment of certain generalized modes of reaction, which are of an emotional, a socially plastic and a decidedly imitative type. Members of such mobs may perform acts which seem to the casual observer quite out of harmony with his training." 103

Imitative acts also appear in all the phenomena of fashion and of transitory custom. To illustrate this one need only point to "any popular craze of the day or the success of any favorite song, opera or novel. The most of people's political opinions, the most of their religious creeds, the most of their social judgments are very highly imitative in their origin." 103

To understand the law that "all consciousness is motor" is so important for a clear comprehension of the psychology of imitation that a few evidences of this theory may here be given. Professor Mosso, an Italian, studied the bodily changes caused by the stimulation of emotions and ideas. When the skin was touched, when something was placed in the mouth, or the eye was stimulated there was always some corresponding change in the circulation and the respiration. Mental work, such as adding sums in arithmetic changed the character of the breathing and the circulation. These changes were measured by means of a measuring apparatus so that the matter

is proved. - Gates found that there is a kind of perspiration for fear and another for joy. Muscle reading proves the same thing. Fixing of the attention leads to involuntary contractions of the muscles that guide the subject toward the place where the object attended to is located. In hypnotism one idea fills the consciousness and therefore must be carried out into action. "Control" is possession by an idea. - An idea results in reaction when there are no conflicting ideas. If a pin is on the floor, we pick it up. The fewer the associations, the less likely are opposing ideas. Imitation means (in general) a copying of some idea received from some person or object in the form in which it was received as, for example, the pose of a statue, the bark of a dog, the movement or the voice of a friend and even the motives of people.

The second prerequisite of first imitative acts is the "instinct of spontaneous activity, first of the muscles, then of the senses and finally of the unfolding intelligence"- which activities constitute the most conspicuous endowment of healthy infancy. "These, however soon blend and become practically inseparable. The nutritive function underlies all this, forming the soil that supports all activity and growth."

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The instinct to imitate operates by the use of the movements required to do the thing imitated. But unless the child has a sense of what movement will do it, he cannot produce such movement. This sense he can have only from previous movements in connection with similar mental content. The new mental content, "the perception

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of a model", must take the place of the old one in the motor scheme. Professor Royce points out that the naive life of the child is made up of impulses, passions, etc. which combine with the imitative tendencies. These then cross and intercross. They combine and mix in all sorts of ways. The reactions of the pure impulses and passions do not lead to any selfconsciousness as do the activities of the imitating, impersonating, dramatizing child.

Most writers agree in calling imitation an instinct or a complex of instincts. To quote Professor Royce: "The foundation of our whole social consciousness seems to lie in certain instincts which characterize us as social beings and which begin to assume considerable prominence toward the end of the first year of an infant's life. These instincts express themselves first in reactions of general interest in the faces, in the presence and the doings of our social fellow beings." Some show pleasure and fascination, some fear or bashfulness. The former are generally more prominent. "On the basis of the general social interests there appear more special instincts, amongst which the most prominent is the complex of instincts suggested by the name imitation. - By imitation the child learns its language, acquires all the social tendencies that make it a tolerable member of society. Its imitativeness is the source of an eager and restless activity which the child pursues for years under circumstances of great difficulty and even when the processes

involved seem to be more painful than pleasurable."

Wundt asserts that the "continued imitation by which the child comes to learn the language that is spoken around it, is impulsive, not voluntary." Compayré, too, denies volition in the earliest imitative acts, but asserts that imitative movements, as soon as they become conscious movements, pass under the control of the will. Then instinct disappears and individuality begins.

Preyer however turns the process about, saying that the first imitations are always voluntary or intentional and become reflex with habit. Waldo, too, believes imitation is acquired and not instinctive, apparently on the ground that "it does not make its initial appearance until about the fourth month". That this cannot stand as a valid argument against its instinctive character need not be proven here, if only we bear in mind the fact of the 'transitoriness of instincts'.

It seems the only possible interpretation of the facts at hand today, to call imitation an instinct, or rather a complex of instincts. Comparative psychology supports these findings of human psychology and yet it must still remain an open question whether or not an elementary type of volition enters into an act that takes an outward copy for its model.

It is generally supposed that we imitate that only of which we have present experience, and that to imitate anything is to have it for standard and stimulus. Thus Mitchell says that 73

without a present thought of what one has learned one does not imitate it. It is confusing to speak of imitation in this sense, he adds. As an argument for what might be called postponed or deferred imitation I shall quote an observation by Waldo and another by Stern. Waldo writes: "My boy of four was taken on a short railroad journey. Seemingly no strong impressions were made, but in a few days a reaction took place and for weeks he lived over the impression received in a small world of his own. It was then seen that not the slightest detail had escaped his attention. He is by turns conductor, brakeman and porter, when necessary the locomotive and experiences no trouble in furnishing steam for propelling power. A flight of stairs becomes a train and he swings himself from a lower stair with all the seeming recklessness of the brakeman. He calls the stations, takes the tickets, and if necessary, acts as passenger, though you will note, perhaps, that the passenger occupies a second place."

Stern in "Die Kindersprache" says that stimuli often fail to cause immediate reactions; that a period of latency frequently intervenes. "Words that have been heard and understood again and again finally attain a certain motor set so that when the proper occasion comes the reaction is made without a fresh stimulus. Thus Hilde had been bidden a 'good night' every evening at bed-time until one evening when she was one year and ten months old, she said 'night' before we could do so. In this case the word was associated very strictly with a definite time and situation and hence it is a valuable proof of mediate (deferred) imitation." Another case may be quoted

from the same writer: "Our daughter, Eva, one year and seven and one half months old, one day surprised us at the table by the apparently very sensible question : Atta,~~Meck~~'s? (Vater,schmeckt's?) when no one had lately used the term." - Psychologically these two types of imitation are essentially alike. The only difference is evidently the amount of time that elapses between the impression and the expression, which probably involves as an essential concomitant a difference in the degree to which the model has become a purely mental (vs. sense impression) content.

One of the most important elements that enters into the structure of a common act of imitation is the play of imagination. Its great value will be seen more clearly in the discussion of the meaning of imitation in the life of the child. That these two, imitation and imagination, go hand in hand is well illustrated by almost any one of the list of observations of imitation cited above. Another case is given here to emphasize the point. "A lesson in our First Reader is about marching 137 and beating a drum. The day it was read the little boys of the class were seen marching about the yard at recess, some of them hitting two blocks of wood together. The next day the same play was taken up and joined in by boys from other grades. A variety of instruments had come into play,- tin cans for drums, two sticks for violins and one boy was playing the trombone with great earnestness. His instrument was a long stick against which he would slide his hand back and forth as he marched. Some of the boys had belts, others had feathers in their caps and all were deeply interested in their marching and playing.- There is no

doubt what to us was most excruciating noise was to the participants strains of the finest music"

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That a very large amount of imitation is playful in character does not need to be further illustrated here. The fact is very important however, for the full realization of the very intimate interrelation between these two predominant phenomena of child life will help to interpret both. The importance of play in the life of the child necessarily borrows much of its value from the element of imitation it contains; and again imitation manifests itself very largely thru play activities.

Certain classifications of imitation are undoubtedly important. But no classification can very well be so arranged that all important differences are brought out. Special classifications must be devised for special purposes. The general divisions found valuable for broad distinctions in the study of imitation in animals as well as in man may be given as 1. Mimicry; 2. Instinctive imitation; 3. Intelligent Imitation; 4. Voluntary or intentional imitation.

Mr. Mitchell points out that spontaneous 78 imitation (instinctive imitation) "takes place at all levels of intelligence in animals and in children after they are six months of age". This type is generally more accurate than the forced or intentional imitation in its movements. The mechanism works more smoothly. Thus children take up the pronunciation of people about them with a fatal facility, guided merely by the sounds, without that

of the means of reproducing them. This reflex type cannot give the children anything but what the model directly contained. Fortunately this type is seldom pure, occurring mostly as a tendency in combination with a freer form.

Persistent or voluntary imitation which finds the copy so interesting that a repetition of the movements occurs again and again is far more important in giving the child conscious control of its own powers with a certain freedom which contrives to vary the action in accordance with the needs of the situation. Baldwin's little daughter, Helen, imitating him in taking the rubber of a pencil off and putting it on again, would do this for half an hour at a time. The importance of this type, i.e. persistent imitation, is evident when we consider that "the child is not doing the same thing over and over. The first time Helen puts on the rubber she does not succeed for a long time and then largely by chance. She pulls it off again, now succeeds more quickly and easily, leaving out many unnecessary movements, etc. etc." Each time the act is somewhat different from what it was before. 127

Waldo's three kinds of imitation have already been mentioned. He classifies his examples into 1. Unconscious imitations; 2. Imitations 'exhibiting more mental power'; 3. Impersonating, socializing imitations. - This classification is adapted to the special purposes of exposition of this particular writer and his present purposes, but it does not claim to be inclusive of all possible cases.

Karl Groos's classification is based on the type of impression, the kinds of objects that serve as models. First in point of time are the imitations of simple movements which are preparatory to more complex imitations. This type is subdivided into the reproduction of a) optical, and b) acoustical perceptions. Second follows the dramatizing, imitative play; - third, the play of plastic or constructive imitation; fourth, the play of inner imitation. It is of course evident thruout that this author's point of attack is on the side of play.

These four large divisions of Groos may be subdivided. Thus the simple movements can be subdivided on psychological grounds. In some cases the movement itself constitutes the center of interest, in others it is the result of such movements. The pleasure experienced in the act of imitation appears in a purer form in the case where the movement itself constitutes the point of chief interest. Another distinction, as to the motive is suggested. The motive may be mere curiosity or it may be the pleasure of being-able-to-do-it-also. The former type is similar in kind to intellectual experimentation. The motive is the question: How is it done? The way or the manner of the action is central. - The latter type is the reply to a kind of challenge. That challenge is: You cant do that! Then all energies are bent to show: I, too, can do it. All these motives mutually support each other.- The simple movements of this first general class of imitations are mostly unconsciously performed,

as when, for example, a South European who dwells in northern lands gradually modulates his excessive gestures.

Among the early imitations of acoustical perceptions we would group such instances as the reproduction of sounds reported by Stern and Baldwin. Stern's example of imitation of vocal sounds has been cited in an earlier paragraph. That given by Baldwin is still more complex. "The first clear case of imitation in Helen occurredⁿ at the beginning of the ninth month. She saw me produce a bell^llike tone by striking my keys against the edge of a vase, after which she did the same act repeatedly." Here the result of the activity seems to be more important in the mind of the child than the movement itself.

The second class, that of dramatic imitative play, involves a peculiar play of the imagination. Other beings are impersonated. The child acts out the part of another and thus in a degree secures the experiences of the other. The extraordinary importance of such imitation for the development of sympathy and aesthetic feeling cannot be calculated at present.

Constructive imitation in which duplicates of things and actions are produced with rags (dolls), sand (houses), chalk or lead-pencil (pictures), etc. undoubtedly plays an important role in the development of the individual.

Inner imitation finally, consists in the mental (intellectual and emotional) repetition of what is supposed to go on in the mind of the thing or the person that serves as a

model. It is a retranslation into one's self of that mental content with which we previously endowed those objects or people.

That type which was named last in our first classification, namely rational imitation has as yet been but little discussed by writers of this subject. This may be due to the fact that it very rarely occurs in a pure form and if it does so occur it is hardly recognizable as a form of imitation. "In rational imitation our attitude depends in no way on the prestige or discredit of those who have adopted a mode of action nor upon the origin of such behavior but on its fitness only. Great men or the crowd, antiquity and novelty do not fascinate the rational imitator. To him everything has a passing value." 99 & 100

Certain elements of culture tend to diffuse by rational imitation; as for example, the practical arts and the sciences. Fast success and not prestige is the foundation of authority to the rational imitator.- Rational imitation prevails more in the practical arts than in manners, dress, amusements or the fine arts, because: 1. Competition hastens the triumph of the fittest machine, tool or process, but not of the fittest garment, ceremony or sport. One dentist practicing painless dentistry forces all other dentists to copy his method. 2. Exact measurements enable us to discover the better of two practical types, electric or cable cars, Jersey or Durham cows, etc., but there are no exact means of measuring and comparing the value of fun in baseball, golf, poetry, etc., etc.

Different schools and movements are possible in philosophy, music, literature, art,

theology, etc. because the relative fitness of each of these cannot be absolutely determined. In the sciences there are no such schools, for the evident prepotence of the one system over the other readily determines the survival of the best. Mr. Ross looks favorably upon the growth of rational imitation in society today. This growth is in two directions: It is extensive, reaching ever new layers of population and it is intensive, invading new departments of thought and activity.

Rational imitation that investigates the fitness and unfitness of modes of procedure is present in some degree in most of the higher forms of imitation. Such imitation we have called voluntary or intentional. But when the copying of a model is done in a completely rationalized way, the activity would, according to the common usage of words, fall under the head of intellectual learning. The conclusion is then inevitable that not every kind of copying is imitation, properly so called. At the lower end of the scale of imitative activities these shade over into mimicry, while at the upper end intellectual or rational learning supplants imitation.

To imitate is, then, not merely to repeat (mimic) nor is it to apply a principle. "If we are said to imitate a rhythm, a law, a manner, in a new material, it is when, instead of having to separate them out and thinking them as abstract objects, we take them embedded in one material and transfer them directly to another." Some degree of adaptation may be found in most

imitation. We imitate in so far only as we are aware of a model, (not necessarily as model), present or absent and seek (consciously or unconsciously) to reproduce it.

Baldwin defines imitation^{as} 1. a process in which one individual uses another as a copy for his own production of something, whether or not he intentionally or consciously aims at the other as a model, or 2. ^{as} the same type of function when that which is imitated belongs to the imitator himself instead of to another person.- The first Baldwin calls 'social imitation' and he means by it that type of imitation which is discussed by sociologists. (Bagehot and Tarde). The second is the 'imitative function' or 'psychic imitation' of Professor Baldwin's vocabulary. 'Social imitation' vs. 'self imitation' will serve well as contrasting terms for the two phenomena in mind.

A confusion as to the use of terms is the cause of a large part of the controversy in regard to the facts of imitation and the rôle it plays in the life of man. - All imitation short of 'reflective' or 'mocking' imitation is such only from the standpoint of the observer. In a functional statement we emphasize not the stimulus but the meaningⁱⁿ of the experience of the imitator. From his point of view it is an attempt at defining his experience. From the standpoint of the imitator the activities involved are volitional and not imitative except in rare cases. Why should an organism imitate for the sake of imitating? It is rather a search after another kind of experience and its meaning and value. "The emphasis is not on the copying of a certain act but on the

attainment of a certain experience which comes thru copying." Thru imitation "the child's personality grows. Growth is always thru action. 15 He clothes upon himself the scenes of his life and acts them out; so he grows in what he is, what he understands and what he is able to perform."

From the point of view of the imita- 67 tor the imitative response of the monkey is practically the same process. The monkey lathers his face- he is trying to define to himself that experience which he feels vaguely thru the eye. Or, to put it another way, the vivid perceptual image of 'man shaving' produces the same activities in the monkey as a result of a fixation of the attention. So with the two year old girl who twirled an imaginary mustache after the copy of a youth opposite her at the table. There was a movement of the fingers at a certain place on the face that seemed to be worth something and the baby girl did her best to incorporate its value into her own experience of sundry hand movements. She was not copying (from her own point of view). She was getting a new experience. The case is similar in a child's first attempts to imitate the speech of others. More or less vivid images of the activities of others are received and these images are mere impulses to action in which the child straightens out some of his own illorganized experiences.

Even in the imitation of others for the sake of ridicule or mockery, tho the situation is complex, the central aim may well be an increasing of the mocker's consciousness of the ridiculous element itself. - The doing of anything others have done renders one more vividly conscious of the value of the other's action. We get the

value the better.

Mr. King points out that Baldwin's 'circular process', a) stimulus, b) activity; a) repetition by that activity of the stimulus, b) activity; etc. is circular from the point of view of the onlooker only. From the imitator's point of view the same stimulus is not repeated. It is a new and different stimulus, a transfer probably from visual or auditory to motor, tactual, etc. "The child is an evolving experience; in him the circular process is in reality a spiral process". Each repetition is a different experience. When Baldwin defines imitation as something external (point of view of the onlooker) he is lead to define all activity^{as} imitative. "Strictly speaking all mental processes are of the spiral type. 67 Each act collects the values of previous experiences and reinstates them, not to have them again but to rise above them to a new reach of experience." This, at any rate, is the fundamental and most important fact about imitation which the psychologists and the educators as such must concern themselves with.

As a final section of this discussion of imitation I propose to treat the interesting question of the function or meaning of imitation. The topics under which this material may conveniently be considered for our purposes are the following: 1. Imitation as a means for the acquisition of movements. 2. The protective function of imitation. 3. Its abbreviative and anticipatory function. 4. Its socializing influences. 5. Imitation as a root of symbolic and aesthetic ideas. 6. Its service to originality and emancipation. 7. The

function of imitation in the genesis and the development of the language (of the individual).

8. Some general educational bearings. - Several of these points can be stated in a brief paragraph, while others require some illustration and explanation.

A reasonable supply of spontaneous movements have already been performed and taken note of by the child before he can perform simple imitative movements. These have prepared the mechanism for more highly coordinated and better controlled activities. When the child performs his first simple imitative movements, he acquires not only those movements which he directly aims at, but in his attempts to make the right movement he tries various intermediary movements until he hits upon the right one. In this process a variety of muscular combinations, which are not those which he was after, have been carried out, e.g. Helen's attempts to put the rubber on the pencil. "Indeed the child may become so engrossed in some of these accidental movements that he forgets the copy and follows up these new movements." 13 All these chance movements constitute a valuable supply of material for later well-directed action, while the experiences gained may lead into entirely new and fruitful fields.

Imitation has been shown to be highly protective in animals - a function which is also clearly evident in the human species. It is seen especially in the behavior of crowds or in the bustle of a busy street. One person anxiously running from some place of danger will cause others

to avoid the spot without any further insight into the situation on their part. The illustrations of this primitive value of imitation need not be multiplied.

A large number of particular instincts ~~are~~ thus made unnecessary by the more general instinct of imitation. And again, "it gives the 78 tribe or race the advantage of the learning of the individuals. Play is the special form in which this particular function of imitation has worked itself out." -

"Filling from time to time his 'humorous stage'
With all the 'persons' down to palsied age,
That life brings with her in her equipage."

"Thus in imitative play in obedience to the biologic law of recapitulation, the child epitomizes and rehearses the fundamental experiences of the race at the same time that he is sounding the depths and shoals of his own nascent powers and thereby prepares day by day to take part in the real work of life which the coming years will bring. This imitative play is at once reman-
niscent and anticipatory. It is made to serve the purpose of bringing the child beyond its present self, to leap into the future and assume the dress and the ways of grown people."

As an infant the child is weak and seems insignificant. But by laying hold, thru imitation, on the adult activities around him he pulls himself up. The leverage gained is of signal advantage to the child. It is also the source of present enjoyment which supplies the needed spring and impetus for later improvement. Without this

propensity a great motive for progress would be lacking.

The socializing influences of imitation are not to be neglected. Probably the most fundamental facts about the meaning of imitation have been touched when Professors Royce and Baldwin at practically the same time announced the theory that thru imitation are laid the foundation stones for any clear distinction between the self and the not-self, the ego and the alter. Professor Royce says in his "Observations on the Anomalies of Selfconsciousness" that the first clear evidence of a form of selfconsciousness appears when a child begins to be observantly imitative of the acts and later of the words of others. From this time "up to seven or eight years of age any normal child remains persistently, altho perhaps very selectively, imitative of deeds, of habits, of games, of customs and often of highly ideal and perhaps quite imaginary models, such as are suggested to it by fairy stories and other similar material." Again: "The psychological importance of imitation lies largely in the fact that in so far as a child imitates, he gets ideas about the inner meaning or intent of the deeds that he imitates and so becomes acquainted with what he early finds to be the minds of other people.- The child that repeats your words slowly learns what they mean. The child that uses scissors, pencils or other tools after you learns, as he imitates, what cutting means, what drawing is and what other such doings are." 105

Professor Royce also shows clearly in other passages that a difference between its own act of imitating and the act which is used as a model becomes evident to the child by reason of the great contrast of the two series of presentations. One set of contents depends upon the child itself. It has control over these contents and there is a certain immediacy about them together with certain sensation complexes which are absent in the acts of others. Those other acts and conditions constitute a set disconnected with the child's "common sensibility". One set of contents, that under voluntary control, is the psychological Ego, while the other set not thus contrrollable becomes the Non-ego. "It is in this contrast that the source of true selfconsciousness lies."

Anna Tolman Smith adds on this point: 120

"- - - Imitation is, psychologically speaking, the one source of our whole series of conscious distinctions between subject and object, that and truth, deed and ideal, impulse and conscience, inner world and external world, - in short of all those familiar and fundamental rational distinctions which psychology has hitherto found so baffling. The contrast between model and imitation is, to my mind, the first appearance in consciousness of that differentiation which in the end makes internal and external experience not merely qualitatively different- as, of course, they more or less are from the first - but consciously discriminated, as at first they seem not to be."

Professor Baldwin has expressed the same theory in several of his writings. The recognition of another self or of many other selves, he says, is an imitative function. "The self arises thru the re~~it~~stating, by imitation, of a copy found in others, together with the reading back of the enriched self-copy into the others." Constraint and obedience of the individual may also be interpreted as a type of imitation according to Baldwin's scheme. "Doing what I see you do and doing what I hear you tell me to do" are alike in function tho they differ in motive. Of course, from the point of view of the doer this is no longer imitation, tho it may well be interpreted by the onlooker as an assimilation and acceptance of the model. So also, 'duties, rights and social contract' come to have meaning ~~when~~ the individual ratifies, approves or gives adhesion to a social situation.

Baldwin's idea of imitation as the method or the process of social organization has two main points then: - First, Ideas, acts and inventions of all sorts are actually spread among the individuals by the process of one man imitating another. But this alone would not yet make it social material, for if a blind copying of the same act by all members of a group of beings would constitute a social bond or relation, we might speak of a 'society of parrots'. - The Second factor that is necessary is a certain imitative assimilation and growth whereby what is imitated

becomes organized in the individual's own thought and affective self. A content which has in this wise been instated into another individual's life must as a final step of the socializing process be ejected into others, so that a certain common ownership of values (rights) and ideas (laws) is established.

The experience in the mind of the child which is secured thru imitation has been compared by others to a spiral rather than to the circle of Baldwin. It is not repetition of the identical inner events. There is a new element in each successive act of imitation. When the child is thoroly familiar with the various phases that constitute an imitative act, he discards the copy. The toy exerts an attraction over the child that is not understood by adults. For days it is explored and reexplored until suddenly all its charms disappear. It no longer affords new experiences to the child. Children imitating lame people, blind people, drunkards, humpbacks, etc. do not do so in mockery, but they do this as they imitate everything else. The repulsive and the beautiful are equally attractive. A girl of five imitated a sick cousin for more than a week. She took bread pills regularly, lay down and covered herself up and acted as her cousin had done. Such behavior brings to the imitator a large portion of experiences which the person imitated had, thus developing sympathy and a growing appreciation of the meaning of the lives of others.

Professor Royce in his book, "The World And The Individual," defines imitation as an activity "whereby I accomplish an act that lies between my old way of acting and the way of my model. Apart from my model I already tended to act thus or thus. Under the influence of my model I tend to approach his way of acting. But I never merely repeat his act. Imitation is a sort of experimental origination, a trial of a new plan, the initiation of a trial series of acts. A new way of action results which is neither like that of the model nor that of my own previous activity. The new connects the other two whose relation becomes clearer thru the new. This new selfexpression tends to repeat itself. All our finite striving includes a creation of new intermediaries between the starting point and the goal - by imitation where that is possible; by random attention to new facts, where such is our only course." The point that imitation in normal individuals does not lead to a literal copying of the model but rather serves as a bridge and a tool for free and original action is thus established.

A further phase of this same question can only be briefly touched upon. Miss Smith remarks in "The Study of Imitation" that "the savage knows only two kinds of deeds, the moral and the immoral, while civilized man interposes another, the unmoral." The observation is a valuable one. For the free activity of the savage is impossible as long as there is no neutral zone in which neither a positive nor a negative attitude is demanded

by the gods. As civilization enters ~~many~~ actions that were once ceremonial in nature become 'only customary' and then in turn become free. Thus that form of imitation which we are wont to despise as mere fashion has significance as the means of emancipating us from that heavy yoke of ceremonial that once prescribed the forms of our indifferent actions as tho they were of moral or religious import.

The idea that symbolism and aesthetics may have their chief source in a certain type of imitation is developed if not originated by Karl Groos. His 'inner imitation' leads directly to the appreciation and development of symbolism and aesthetic feelings. When we imagine ourselves to be another person or some object in our imitative play, our mind experiences inwardly the psychic processes which the other person or the object would experience if both had a mental life analogous to our own. We also repeat, in an ⁱⁿipient stage at least, the movements which that object performs and then we ejectively endow that object with the moods and ^{the} feelings which we experience in connection with those motions. Thus the roll of thunder impresses us as the voice of a mighty and angry Being. Groos conceives of such inner imitations as directly connected with certain definite motor reactions. He does this on the basis of his own experiences, thus bringing them into close relation to imitative play generally. The child that imitates the animate and the inanimate by gestures and physical

attitudes employs these gestures and attitudes in a symbolic way. The boy who plays that he is an army officer as he prances about on his hobby horse and wears his paper helmet has by these means identified himself, both in mind and in body, with the officer whom he immitates. But he is equally capable of representing a bench, a locomotive or a horse without ever ^{is}completely forgetting his own different identity. The lifeless doll becomes to the playing child a symbol of life for the time being. When playing or imitating other things (living or lifeless) the child experiences certain very definite reactions and these determine very largely the child's interpretations of the objects concerned. Thus the foundation for a complete theory of the genesis of aesthetic feelings may lie embedded in these complex tendencies to imitate. For it seems plausible that, were our methods of determining and measuring bodily motor responses more refined and better applicable, we would discover movements of some sort in connection with all our aesthetic and affective life. - Our 'attitude' is of great importance in our appreciation of plastic art. We cannot satisfactorily focus such figures as the stooping Medicean Venus if we stand before it bolt upright with all our muscles tense nor can we do so when looking at very erect and braced figures unless we, too, inwardly imitate, adjusting our muscles to the attitude we try to appreciate.

The criticism that would be offered to such a theory of aesthetic appreciation is undoubtedly this, that it can in any case apply only to that portion of humanity which is of the 'motor

type'. Those who are not motor would, it seems, necessarily have to stand low in their aesthetic appreciation. If a motor response (inner imitation) is essential for a full appreciation, those who do not find such a response within would be forced to conclude that they cannot get the genuine experience of which their fellows of the 'motor type' boast. Not so, for there probably is no absolute distinction between 'motor' and 'non-motor' types of individuals. Such distinctions are very likely relative only. And again there are probably many who are definitely of the motor type, but who are absolutely unable to discover this fact introspectively. If objective tests could be applied, these motor adjustments might come out very clearly.

All the topics concerning the functions of imitation thus far discussed are more or less directly related to the problems of education. Yet one field which is of immediate school-room interest may be mentioned. The acquisition and the mastery of a language is one of the central problems of the pedagog. A child's language is not an invention but is learned by imitation. He accepts certain fixed habits of breaking up the total ideas into parts which are expressed in parts of speech, such as nouns, verbs, adjectives, etc. The manner and rate of reading is also the result in part, at least, of imitation of others. "In the Orient children bawl in concert over a book, imitating their fellows or their teacher until they come to know what the page says. Many American ^{children} probably learn to read in this way, having pored over pictures and books

and illustrations of nursery jingles and fairy tales that were told them until they could read them for themselves. Some hopeful enthusiasts believe that some day the debris and obtrusive technique of reading methods may melt away into the simplicity of some such practice as this."

"Those who articulate most correctly form the habit by unanalytical imitation of the words and the sentence-wholes which are correctly spoken by those about them. Children who have not had such fortunate speech environment still find their best corrective in the copy set for imitation in the oral practice of the school. The natural method of learning to read is just the same as that of learning to talk. It is the method of imitation. - - - Real reading in which the author's meanings are felt and felt in a perspective of values in which we actively and sympathetically follow the ins and outs of his intentions, selections and associations and feel his cautions, his fidelity to truth, his accuracy and method, - such reading cannot but train the mind to modes of functioning that are similar to his."

Sarah E. Simons reports an experiment 114 in imitative writing in the Washington High Schools. Since imitation is the 'preliminary step to invention and creation', It was supposed that more direct use could be made of it in the teaching of composition, the writing of which is so generally a distasteful task. The following uses of imitation in the teaching of English are postulated by the

writer; but they are not supported by both positive and negative evidence. "First, Imitation gives new zest to theme work. Second, The pupil must work with his eye on the object. This leads to close observation, to accuracy of expression and to ~~enrichment~~ enrichment of the vocabulary. Third, It stimulates and strengthens the imagination. Fourth, It aids interpretation and appreciation of the masterpiece. Fifth, It gratifies the pupil's instinct for construction. Sixth, It promotes rather than retards individuality." - The results of the experiment are reported to have been very satisfactory. Miss Simons continues: "The imitative work of the third and fourth years was productive of most satisfactory results. Genuine enthusiasm was shown and the effect of this practice on all the composition work was far-reaching. Especially noteworthy was the verse-writing. After the study of Chaucer's Prologue and The Knight's Tale, for example, imitations were assigned. The response was surprising both because of the number of pupils who handed in really creditable lines and because of the note of appreciation evidenced by the product."

The following poem is an example of the responses received to the above assignment:-

The Foot Ball Player.

A foot ball player ~~eeek~~ with us there was.
 His heer was long and gold and shone lyk glas.
 And it was thick and mussed and stoud about
 In al directions; and he was stout
 And eek he was ful brood and varry tall.

His arm was in a sling, that was not al,
 He limped when he walked about the boat,
 He wore a bandage tyde about his throat.
 Upon his cheek ther was a scar ful reed,
 A piece of sticking plaster on his heed.
 For sooth he was a foot ball man,with-alle,
 But sooth to seyn, I noot how men him calle.

The general bearings of imitation on the problems of education are very numerous and intricate as this whole paper has tended to show. A few more instances will help to emphasize this fact. Bell Waldo wrotes: "I visited a village school. The teacher moved about very quietly. A majority of the pupils moved about in the same manner. This was particularly noticeable because so many of the boys were large and awkward and wore heavy boots." - "In the second grade was a colored boy a little older than the rest. He was more observing^{and} withal very entertaining and amusing. It was my custom on entering the room from hall duty to stand before the school and wait until each child was in position. If one was slow about it, I sometimes said, 'James, I'm waiting for you.' One day Eddie, the boy mentioned, went on to the platform to 'speak a piece'. He folded his arms behind him, looked about the room and spied an uneasy child twisting about in his seat. What was my surprise to hear him say, 'Johnnie, I'm waiting for you'. Not a child smiled and Jonnie faced the front, holding his little hands on his desk. Then Eddie began his piece". (From a Denver School-room). - "While walking to school

with some of the children one little girl said to me, 'Four of us girls are going down town to-night. We like to go down town together. We always have fun. We play we are the teachers and stick out our chins and hold up our dresses.'"

We conclude: Both good and bad models are imitated. The results are relatively permanent. The proper use of imitation might shorten the period of teaching. Much of the motive and the interest necessary for good work is due to imitation. The rapidity, facility and certainty of the whole learning process depend in no small degree upon it. Above all, the atmosphere of freedom, of unstrained, simple relations - an atmosphere in which there is less of the feeling of suspicion and distrust, but more of naturalness^{and} genuineness - must pervade the work of education if imitation is to perform its function effectively.

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